



Water Study

PELIMINARY MASTER/BASIS OF DESIGN REPORT

WATER & SEWER

for the Zoning Case

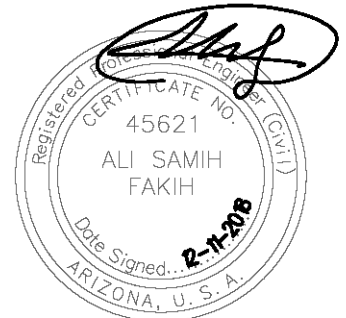
McDowell Mountain Manor (Ranch Gate & 128th Street)

Southwest corner of 128th Street and Ranch Gate Road
Scottsdale, Arizona

Prepared For:

HHL Land, LLC

Prepared by:



EXPIRES 12-31-19

Sustainability Engineering

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Project Number: 18042

Submittal Date: August 3, 2018

2nd Submittal: December 13, 2018

Zoning Case No.: 18-ZN-20148

PRELIMINARY Basis of Design Report

☒ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REVISE AND RESUBMIT



Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.

For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY scan

DATE 1/28/2019

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1. EXECUTIVE SUMMARY

The proposed development consists of 40 acres of undisturbed desert land located south and west of 128th Street and Ranch Gate Road in Scottsdale Arizona. The property is presently zoned R1-130 ESL and is requesting a change to R1-43 ESL for the development of thirty-three (33) single-family residential lots. A preliminary plat, case number 11-PP-2008#2, consisting of thirteen (13) single family lots was approved in 2013.

Public right-of-way exists along Ranch Gate Road and a roadway easement along 128th Street. An existing twenty (20) foot wide public utility and roadway easement exists along the project's south property line (Juan Tabo Lane alignment) providing access to adjacent parcels.

City of Scottsdale is the water and sewer service provider for this property and all water and sewer improvements will be designed and constructed to City's standards. Public onsite water extensions will be looped through the development from Ranch Gate to Juan Tabo and east to 128th Street. Extension of the 128th Street water line south from Ranch Gate across the site's frontage will be either constructed by this development or others as needed.

Sewer service will connect to an 8" sewer along the project's frontage to Ranch Gate and additional connections to a sewer in 128th Street as topography dictates. Likewise, extension of the 128th Street sewer line south from Ranch Gate across the site's frontage will be either constructed by this development or others as needed.

City staff has stated water and sewer facility payback agreements (Reference No. 4) exist for infrastructure located adjacent to this property and the related facilities. Terms of those agreements need to be satisfied per the respective provisions of those agreements. Refer to Section 9.

2. INTRODUCTION

2.1 PLAN OBJECTIVE:

The purpose of this report is a) show demands representing the existing and proposed zoning impact, b) show the proposed maximum water and sewer demands and c) present sufficient water and sewer investigation to support the rezoning request.

2.2 SITE LOCATION

The subject property consists of one parcel with the following County Parcel ID number:

- 217-01-025A

See **EXHIBIT 1 - Vicinity Map – Context Aerial** for the project's location with respect to major cross streets.

2.3 PROPOSED DEVELOPMENT

2.3.1 Existing Site Description:

This site is vacant desert land generally sloping from the west to the east (elevation 2700 +/- to 2640 +/-) at approximately 4%. Refer to **EXHIBIT 2 – Aerial** for an overall view.

2.3.2 Proposed Site Development:

The current plan for the property proposes thirty-three (33) single-family residential units potentially featuring private streets and a gated entry. All necessary tracts and easements for the installation of utilities will be provided as part of the final plat.

3. DESIGN CRITERIA

3.1 DEVELOPMENT CRITERIA

Existing zoning: R1-130 ESL

Proposed zoning: R1-43ESL

Acreage: 40

Demands, system layout, system pressures, velocities, head losses and fire flow will be all be in accordance with the City's DS&PM, 2017 revision.

Fire flow demands utilized in the final hydraulic calculations will be in accordance with requirements of the 2015 International Fire Code. A 1000 gpm system fire flow demand is anticipated per Appendix B of the Fire Code based on the floor area of wood frame homes being less than 6200 sq. ft.

4. DEMANDS

4.1 EXISTING AND PROPOSED DEMANDS

Refer to the tables below for the existing and proposed water and sewer demand calculations based on the design criteria in the City's DS+PM.

EXISTING ZONING

Table 3: WATER DEMAND CALCULATIONS

	Units	Avg. Day Demand (GPM)	Max Day Peaking Factor	Peak Hour Peaking Factor	Avg. Day Demand (GPM)	Max. Day Demand (GPM)	Peak Hour (GPM)
R1-130	13	0.69	2	3.5	9	18	31

Table 4 - SEWER DEMAND CALCULATIONS

	Units	Avg. Day Demand (gal/person)	Persons per Unit	Avg. Day Demand (GPD)	Peaking Factor	Peak Flow (GPM)
R1-130	13	100	2.5	3,250	4	9

PROPOSED ZONING

Table 1: WATER DEMAND CALCULATIONS

	Units	Avg. Day Demand (GPM)	Max Day Peaking Factor	Peak Hour Peaking Factor	Avg. Day Demand (GPM)	Max. Day Demand (GPM)	Peak Hour (GPM)
R1-43	33	0.69	2	3.5	23	46	80

Table 2 - SEWER DEMAND CALCULATIONS

	Units	Avg. Day Demand (gal/person)	Persons per Unit	Avg. Day Demand (GPD)	Peaking Factor	Peak Flow (GPM)
R1-43	33	100	2.5	8,250	4	23

4.2 WATER ZONE

The property will be developed entirely within pressure Zone 12.

4.3 PHASING OF PROJECT

The project is proposed to be constructed in a single phase.

4.4 SUMMARY NARRATIVE OF DEMANDS

The max day + fire flow scenario of 546 gpm will likely govern the water system design.

Onsite sewer flows may increase slightly in the future by development of the two parcels south of Juan Tabo Lane. This increase will be minimal with respect to the existing topography and more than sufficient capacity exists in the proposed 8-inch system.

5. EXISTING INFRASTRUCTURE / CONDITIONS

5.1 ADJACENT PIPE LINES

City of Scottsdale Water & Sewer Quarter Section Maps (47-57 and 47-58) show a 12" water line available in Ranch Gate along with an 8" sewer. No water or sewer lines are currently constructed along the property's 128th Street frontage. Refer to **EXHIBIT 4** for the COS Water and Sewer Quarter Section Maps (47-57 and 47-58).

5.2 ADJACENT DEVELOPMENTS

Sereno Canyon abuts the west side of this site and three undeveloped parcels abut the south line. Ranch Gate Road and State Land lie to the north and 128th Street and two undeveloped parcels lie to the east. Story Rock, a master planned community, also lies east of 128th Street encompassing most of the available private land.

6. PROPOSED INFRASTRUCTURE

6.1 WATER DISTRIBUTION SYSTEM

This development will connect to the 12" water line in Ranch Gate Road, extend through the interior street system, connecting to a proposed 8" line in the Juan Tabo alignment and reconnect

to the 128th Street water line at the south east corner of the site providing redundant domestic water and fire service. A 12" water line along the site's 128th Street frontage will be constructed by either this project or others as construction timing dictates. Refer to **EXHIBIT 3** for the Conceptual Site Plan.

6.2 SEWER COLLECTION SYSTEM

Site topography will likely require a connection to the existing 8" sewer line in Ranch Gate Road at the main entrance and two connections to an 8" sewer line in 128th Street from the two cul-de-sacs. Likewise, the 8" sewer line along the site's 128th Street frontage will be constructed by either this project or others as construction timing dictates. A sewer line will be extended off a southern cul-de-sac providing service to two of the three undeveloped parcels at the Juan Tabo alignment. The third undeveloped parcel will have service available off 128th Street. Refer to **EXHIBIT 3** for the Conceptual Site Plan.

6.3 MAINTENANCE AND OWNERSHIP

All water and sewer lines are proposed as public lines located within rights-of-ways or easements/tracts and will be owned and maintained by the city.

7. WATER COMPUTATIONS

7.1 DESCRIPTION OF MODEL

The proposed water system will be designed to meet the criteria of COS Water, the Arizona Department of Environmental Quality ("ADEQ"), and Maricopa County Environmental Services Department ("MCESD").

Bentley WaterCAD® Version 8i will be used to model the water distribution system for the Final Water Basis of Design Report.

8. SEWER COMPUTATIONS

8.1 DESCRIPTION

Sewer flows will be evaluated using Manning's equation and the parameters within the DS+PM in the Final Sewer Basis of Design Report. Excel spreadsheets will tabulate the pipe hydraulics including invert info, pipe diameter, n, slope, peak flow, flow depth, d/D and flow at 0.65 d/D.

9. SUMMARY / CONCLUSIONS

- The Water Facility Payback Agreement indicates sufficient water supply is available to support domestic and fire flow demand of this project. Payment for 33 EDU's of water service is required prior to approval of the final plat. Offsite improvements will include the extension of a 12" water line along the 128th Street frontage. A fire hydrant flow test will be scheduled to support hydraulic calculations with the final design report.
- Sufficient sewer service is presently available at this time as capacity of the sewer lift station located north of Ranch Gate at 128th Street is not fully reserved through provisions of that

facility's payback agreement. The agreement indicates sewer capacity within the regional lift station is based on a first-come first-serve basis and reserved upon payment (reservation) for the EDU's of sewer service. Reservation of available EDUs is required prior to the approval of the final plat.

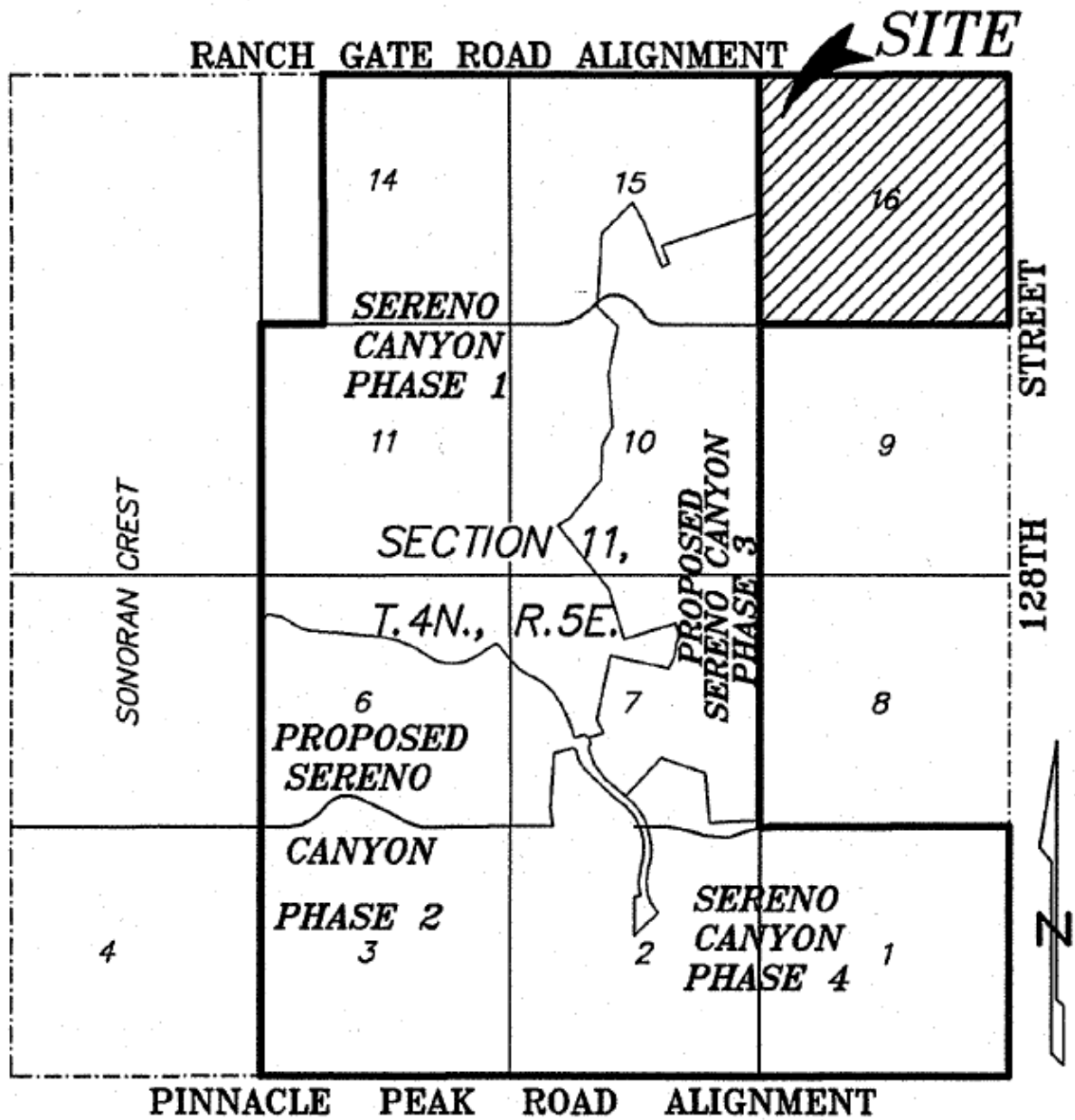
- Per the Facilities Payback Agreements, the developer may request a partial reimbursement of fees paid for the 33 EDU's of water and sewer service through a credit agreement with the City after payment of the appropriate development fees associated with the meter size. The respective reimbursement of a development fee cannot exceed the fee amount and is paid quarterly as meters are set.

10. REFERENCES

1. COS QS numbers 46-58.
2. City of Scottsdale Design Standards & Policies Manual, 2017 - Chapter 6 – Water.
3. City of Scottsdale Design Standards & Policies Manual, 2017 - Chapter 7 – Wastewater.
4. Reimbursement/payback agreements:
 - Ranch Gate Road street payback agreement (1-TP-2016)
 - Water and sewer facilities payback agreements:
 - Facilities Payback Agreement – Water System, 1st Amendment (2010-168-COS-A1)
 - Facilities Payback Agreement – Sewer System, 1st Amendment (2010-169-COS-A1)

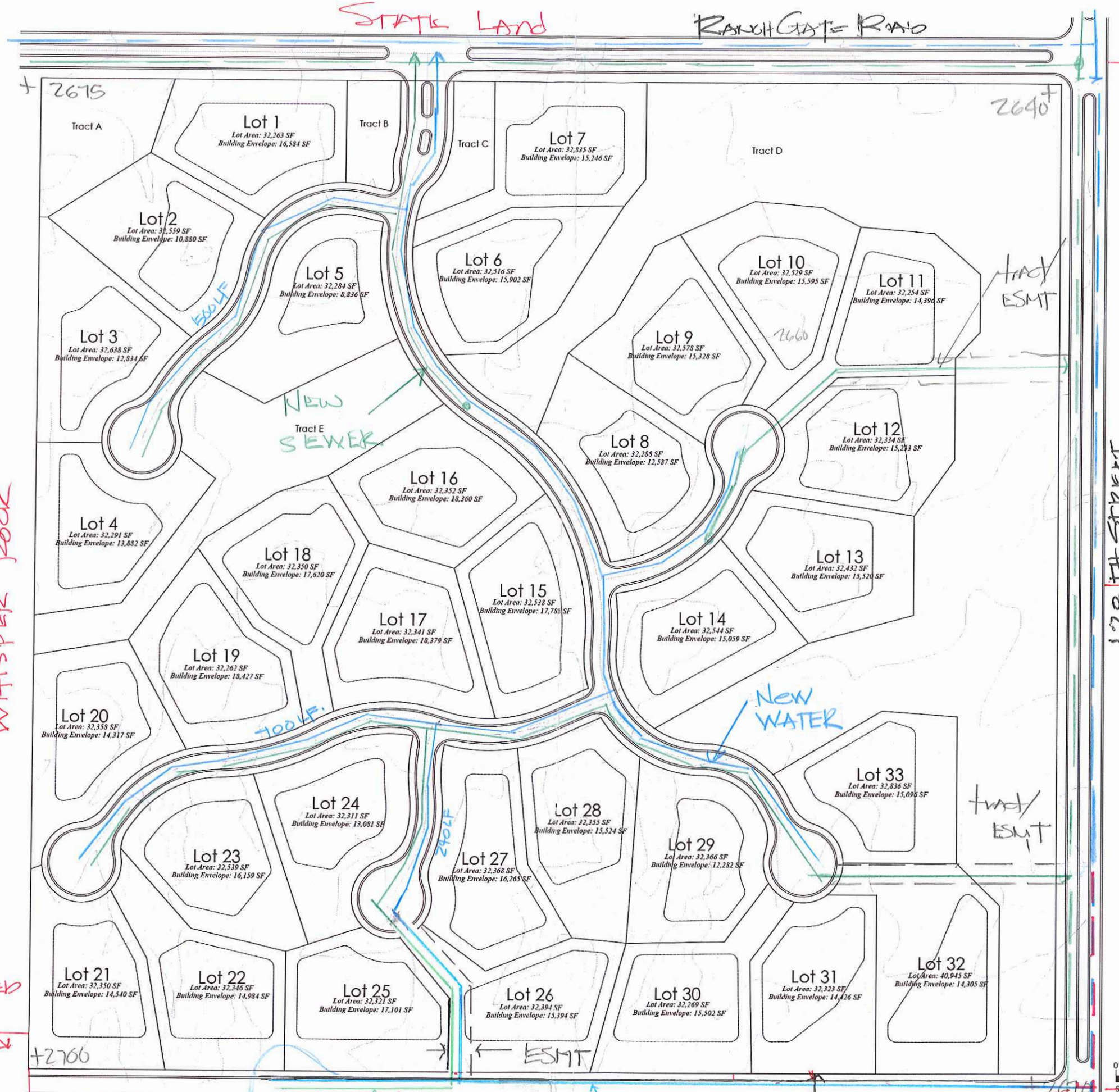
11. EXHIBITS:

- EXHIBIT 1 - Vicinity Map
- EXHIBIT 2 - Aerial
- EXHIBIT 3 - Site Plan
- EXHIBIT 4 - Q-S Map 46-58 (water, sewer, topo)



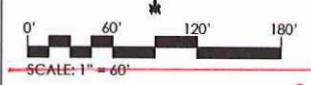
VICINITY MAP
N.T.S.

EXHIBIT 1



Ranch Gate - Conceptual Site Plan

EXHIBIT 3



Prepared by: Greey Pickett
May 31, 2018

